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The price of raw sugars of 96° test has kept very steady the past month at 4½ cents, in New York, with no indications of any immediate change. Probably never in the history of sugar in the United States, has the manufacture and refining of sugar been more prosperous than during the present year. Notwithstanding the fierce cut-throat rivalry of the numerous and wealthy refineries, they are all making money more rapidly than during any previous year, and the sugar consumption for 1899 will greatly exceed that of any previous year in American history.

A FRESH WARNING.—After all the talk about the fermentation of sugars that was started by the director of the experiment station in 1895, very few complaints were heard from the refineries. This year, however, several complaints have been made about sugars fermenting, and attention has been called to the necessity of better cleaning and liming of the juices, and to the drying of the sugars—what we planters called the "crusade against fermentation by Dr. Maxwell," which was said by him to have done more good than anything else in bringing about better work in our sugar houses. It looks now, however, as though we need to be constantly on the lookout, or the standard of our sugars will again go down. It will be well to watch carefully in this matter.

The Michigan State Legislature adjourned without making an appropriation for paying the one cent a pound beet sugar bounty provided for by the law enacted two years ago. The

Michigan sugar companies at Bay City have demanded of the Auditor-General a warrant for $24,262, bounty earned this year. The latter has appealed to the Attorney-General. The Auditor-General claims that the bounty law is unconstitutional. The good people of Michigan have been earnestly disposed to develop the beet sugar industry in their State, and the present conflict with the State Auditor is very much to be regretted. The law was thought to be constitutional at the time of its passage, and the refusal of the auditor to approve of the claims now presented will be a serious setback to the industry.—Louisiana Planter.

The appointment of Mr. A. T. Atkinson as United States commissioner to take the census of the Hawaiian Islands is the most appropriate that could possibly have been made, and the head of this bureau at Washington is to be complimented on the choice. Besides having been a resident here for twenty-four or more years, and also having been the last census commissioner in 1895, he is personally acquainted with almost every householder, be he native or foreigner, and can speak nearly every language spoken here except Chinese and Japanese. Another point that should not be overlooked is the disposition of the Washington government to select the fittest men for any service here that may be required. The American government and the head of the census bureau may rest assured that the choice of Mr. Atkinson is endorsed by both foreigners and native Hawaiians here, who know and highly esteem him as the right man in the right place.

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THE SUGAR SITUATION IN NEW YORK SEPTEMBER 1.

Advance in the price of sugar and the greatly increased sales at the advance provide profits which, according to sugar trade authorities, are running beyond all records since the sugar trust was organized. And on this account it is figured that Mr. Havemeyer has come to favor the division of the coffee and sugar trades into an independent line, the Sugar Trust acquiring an influential interest in what will be a coffee trust, and representatives of Messrs. Arbuckle becoming co-trustees with Mr. Havemeyer in the enlarged Sugar Trust. It is declared that the trust is earning at a rate of over 18 per cent. per year.

Very little significance is attached to the reported formation

of a competitor to the American Sugar Refining Company, in Pennsylvania, with a capital of $8,000,000. The company was formed several weeks ago. It is understood that the concern proposes to utilize a new process for refining sugars. If new plants are erected the company could not complete its arrangements to actively supply refined sugars within less than a year or eighteen months.

By January 1st the Pennsylvania Sugar Refining Company expects to have in operation a colossal plant, to be erected on the Delaware River. A large tract of land along the Belt Line Railroad has been bought at a cost of nearly $200,000, and plans for a big building have been prepared. The capacity of the plant at the outset will be 5,000 barrels a day. The company has secured a new and secret process for the filtration of sugar, which will effect, it is claimed, great saving in labor expense. The capital stock has been placed at $8,000,000. Henry D. Moore is the temporary president of the new company.

The value of sugar imported at New York during the first seven months of 1899 was $33,885,099, compared with $25,177,102 for the corresponding period last year. There was thus an increase this year of about 34½ per cent.

Messrs. Willet & Gray say of sugar: The demand for refined will be larger for the canning season, and with further increased meltings necessary, the stocks should largely decline by the end of the year. Everything continues favorable for refiners and the trade. The weather is conducive to large consumption of sugar, and the deliveries under the guaranteed purchases are daily large.

A notable feature of this week has been the coming together more nearly of the prices of old and new crop beet sugars, these prices being now within 9d. of each other and mostly brought about by the decline of the old crop quotations, which has been rapid and large. It looks as if our refiners can remain indifferent to the old crop beet sugar and only show an interest in the new crop deliveries.

Latest advices from New York State that the American Sugar Refining Company has succeeded in making contracts with all the members of the National Association of Wholesale Grocers, by which the latter agree to purchase all their sugar from the Sugar Trust. As this combine includes three fourths of grocers of the United States, the rival sugar refiners will be restricted to a comparatively small trade. As this sugar war is a battle of millionare giants on both sides, it is probable that in some way the independent refineries will find means to keep the trade which they already have. It, however, indicates a very bitter warfare.

SUGARCANE PLANTATIONS ON THE HAWAIIAN ISLANDS, 1872.

TOTAL SUGAR EXPORTS FOR 1872, 16,995,402 LBS.

ISLANDS.	Hands employed.	Males—native.	Females—native.	Chinese.	Other Nationalit's.	How many more would employ.	Acres in Cane.	Cane Land in the neighborhood.	RACE PREFERRED.
HAWAII.									
Kaiwiki	175	132	36	—	7	50	650	7000	Japanese.
Kaupakuea	245	125	20	100	—	50	600	1500	Polynesian.
Paukaa	100	100	—	—	—	25	180	7000	Chinese or Jap.
T. Spencer	150	128	12	10	—	—	400	1000	Chinese or Jap.
Kohala	200	182	18	—	—	50	900	2000	Chinese or Jap.
A. Hutchinson	39	29	—	5	5	45	150	4000	Japanese.
Onomea	180	127	—	51	2	50	500	3000	Polynesian.
Dr. Wright	50	50	—	—	—	10	100	—	—
J. C. Costa & Co.	14	12	2	—	—	15	60	4000	Japanese
E. C. Bond	5	5	—	—	—	—	30	3000	Polynesian.
D. Hitchcock	32	32	—	—	—	40	60	5000	Chinese.
Hinds	100	100	—	2	—	20	150	2000	— —
Thomas Hughes	25	19	6	—	—	—	120	300	Portuguese.
Frank Spencer	10	8	—	—	—	6	—	6000	Japanese.
E. Bond	2	2	—	—	—	—	—	6000	Hawaiian.
J. W. Smith	3	2	1	—	—	—	—	6000	Portuguese.
James Woods	7	9	1	—	—	—	—	4000	Hawaiian.
MAUI.									
Makee's	170	78	—	51	41	100	120	3000	Japanese.
Haiku	200	90	37	58	15	50	850	3000	Japanese.
A. H. Spencer	77	60	12	2	3	—	400	600	Polynesian.
Wailuku	250	170	68	14	6	100	500	3000	Japanese.
Waihee	180	156	24	—	—	25	80	1000	Japanese,
Waikapu	130	120	10	—	—	50	900	1200	Chinese.
Hana	80	70	—	10	—	25	150	500	Chinese.
Bailey	60	60	—	—	—	—	100	—	— — —
Hobron	60	60	—	—	—	—	150	—	— —
Campbell & Turton	268	180	43	35	10	50	600	1200	Chinese.
West Maui Sugar Associat'n	150	130	20	—	—	—	400	—	—
H. P. Baldwin	60	40	—	20	—	30	400	760	Japanese
Ed. Jones	12	10	2	—	—	70	5	500	Japanese.
OAHU									
L. Chamberlain	37	15	7	15	—	20	140	3000	Japanese.
Laie	60	50	10	—	—	—	200	300	Polynesian.
Waialua	25	19	6	—	—	10	50	—	Japanese.
Keaahala	25	20	5	—	—	—	125	—	—
Kualea	120	100	20	—	—	25	400	—	Japanese.
Kaneohe	60	40	—	20	—	25	150	—	Chinese or Jap.
M'Keague	60	35	—	25	—	25	200	—	Chinese or Jap.
R. F. Bickerton	4	3	1	—	—	—	5	1000	Japanese.
S. N. Emerson	10	9	1	—	—	3	—	350	Japanese.
KAUAI.									
Princeville	125	80	10	65	—	120	350	3000	Hindus
Lihue	120	87	8	20	5	30	180	1600	Japa ese
Waipa	30	30	—	—	—	20	100	—	—
E. Lindemann	30	10	6	14	—	20	100	350	Chinese.
A. Conrad & Co.	25	20	5	—	—	10	—	—	Japanese.
D. M'Bryde	12	8	4	—	—	4	—	1500	Japanese.
J. H. Wright	—	—	—	—	—	—	—	5000	Japanese.
J. & F. Sinclair	30	30	—	—	—	—	—	5000	— —
MOLOKAI.									
T. G. Dwight	5	3	2	—	—	3	—	3000	Hawaiian.
LANAI.									
W. M Gibson	15	10	1	4	—	50	—	2000	Hindus or Jap.
	3921	2904	395	526	96	1330	12,355	105,810	

THEN AND NOW.—1872-1899.

The energy and push displayed by the managers and directorates of the new sugar plantations, started during the present year—notably the Olaa on Hawaii, the Kihei on Maui, the American on Molokai, the Waialua and Honolulu on Oahu, and the McBryde on Kauai—furnish a bold contrast with similar enterprises here many years ago. The chief advantage has been derived from having better canes and better machinery, greater experience and skill in the field and mill, with larger capital and ample means and labor to push the work in each department from the start to the finish, so as to secure an income from the growing crops at the earliest date possible.

It will be interesting here to examine the list of sugar plantations or cane growers in these islands in 1872, as shown in the table on the opposite page. The early history of some of these enterprises will doubtless be recalled by many who know of them and the disasters that befell them. Very few of these pioneers remain to tell the story of their various misfortunes. The total exports of sugar for 1872 were a little less than 8,500 tons, and this was the outcome of 38 plantations with their crude open boiling pans and evaporators. There were 12,355 acres of cane under cultivation. From such small beginnings did the leading industry of Hawaii commence. Either one of several of our larger estates has turned out this year more sugar than the entire list of 1872 produced.

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OVER SEA AND LAND.

A summer outing, over and beyond the blue ocean, carries with it a fresh, invigorating change, which can nowhere be secured to the same extent, within the limits of our tropical group, fanned though it may be, with perennial trade winds. Whichever direction one chooses to take—north, east, south or west, there is opportunity for securing rest and relief from the daily routine of office work, and in some cases from its enervating results. While these islands, which we fondly claim as our home, are unquestionably as healthy as any other part of the world, yet even here, diversion, change, and especially rest—physical and mental—are as necessary for health, as in any other country.

Trans-Pacific travel, like that of the Atlantic, is so rapidly

increasing that to meet its demands requires larger vessels on every route. And these, it is a pleasure to note, are now in process of construction, so that, during the next twelve or fifteen months the accommodations for travelers across the Pacific, promise to be met, including many of the late improvements and conveniences, which nautical ingenuity is constantly devising. It is not pleasant for passengers who have paid full fare for the best accommodations, to be forced to accept a bed on the transom, under an open port-hole, and then be washed out of his bed by a bucketful of water dashed unawares by a passing wave. A simple device has been invented, and is in use on some ships, which, while admitting fresh air, excludes both rain and sea water from the open ports, thus securing rest, comfort and health to the occupant.

The trip from Honolulu to Victoria is not a long one—seven days, and where smooth seas are met from port to port, as is usually the case on this route during the summer months, it is a very pleasant one. The Australian vessels are fitted with side or bilge keels, which greatly assist in keeping the ship steady and prevent the rolling that makes life on some vessels so miserable. Victoria and Vancouver are the principal if not the only ports of importance that Canada possesses on the Pacific coast, adapted for large vessels. The former, located on Vancouver Island, is much the older of the two, while the latter, ninety miles distant and on the mainland, has a material advantage in being the terminus of the Canadian railway system, which is a very great aid to its growth and prosperity, as may be seen in the costly buildings in process of erection, in the broad and well-laid asphaltum avenues, and the fine electric car system, which extends a long distance to the neighboring parks and villas from Vancouver.

The cars that run overland from Vancouver to Montreal, and also South to Seattle, start on the steamship wharf, which makes the transfer of passengers, baggage and freight very convenient, and without the bustle and confusion often met, when the transfer is from one side of the city to another distant locality. Once beyond the city limits, the appearance of prosperity disappears, and scattered huts and poverty mark much of the route of the cars till the boundary line between Canada and the United States is crossed. From this point on, a marked difference is observed in the rude dwellings of the pioneer settlers, surrounded with fences, trees and well-tilled fields. The change from Canadian soil to that of Washington

State is so marked that every observing traveler must notice it, and many ask,—why is this? The soil and climate are the same—the difference must then be caused by the feeling which possesses every settler in the United States that the air he breathes and the soil which he tills and owns in the latter are stamped with a purer, healthier and more lasting independence.

Crossing the boundary line that separates Canada from the United States is not so easily done as one might imagine, when looking at the rails which fondly clasp each other, and show no signs of being British or American. One can hardly find where the line actually is. Still the customs inspectors—both British and American—are on hand to closely inspect every parcel and trunk on every train that arrives here from the north or south. Hand baggage is seldom molested, but trunks have to be overhauled. While an editor's rusty hand-grip was thought not worth an inspection the trappings of a hunter—gun, powder, shot, fishing rod, etc., were considered worth seizing and sending to the customs authorities of Portland or San Francisco for appraisement, making a great deal of trouble to the owner. It would seem as though some more simple and equally effective method could be adopted in such cases, where there is no intent to evade the customs regulation.

Seattle is reached after a ride from Vancouver of seven hours in the cars. This city, like San Francisco, is built on a series of hills, with several miles of harbor frontage, which gives it great advantages as a shipping port, and it is evidently destined to become a rival to San Francisco, both in its coastwise and foreign trade. Its overland railroad connections are also among the best. Its population is said to be nearly if not quite 200,000, and increasing rapidly.

Passing Tacoma after a short stop, the train rushes on through the rich farming country of Washington State, passing numerous growing villages, till it reaches the Columbia river, which is crossed on a huge ferry boat that takes aboard in one trip the entire train of twelve cars, including the locomotive and tender. A short ride of half an hour along the southern bank of the Columbia, brings us to Portland, which is located at the junction of the Columbia and Willamette rivers, and is the center of a large and growing trade from the States of Oregon, Washington and Idaho. The Oregon travel to and from San Francisco is about equally divided between the rail-

road and the steamers, which are large and commodious boats carrying comfortably two hundred passengers. It was on one of these steamers that we witnessed a fire drill which was more perfect and satisfactory than anything of the kind ever seen at sea. In an instant, and before the steam whistle had ceased sounding, some fifty men were on deck, each having an axe or a bucket, some of them filled with water; others sprang to the upper deck and attached the tackles to eight life boats, which were hastily unlashed from their fastenings, and hoisted over the ship's railing, ready to lower into the water. All this was done in less time than it takes to write it—certainly not over two or three minutes. We have seen many fire alarm drills at sea, but none that could compare with this on the steamer Columbia, which, for prompt celerity and perfect discipline, it would be hard to surpass.

Portland, or more correctly Astoria, which is located on the mouth of the Columbia rives, is the principal center of the extensive salmon fishery of the Pacific, which supplies the world's market with this delicious food. The homes of these fish are the Columbia river and the northwest inlets up to Alaska, the fresh water streams furnishing their breeding places, while they live in the ocean along the shores, and attain their growth of from two to three feet in length during three years. The average annual catch of salmon is between forty and fifty millions of pounds, and it is only a question of a few years, when the supply will be greatly reduced and eventually exterminated, unless some restrictions are placed on the industry. The present annual catch is valued at $3,000,000, at the canneries, and there is probably no other kind of fish so well adapted for ships' supplies as this. The choicest of each year's pack goes to Europe, which pays the highest price for it.

In connection with the above, our readers will be interested in the following account of how salmon are cured and packed, which appeared in the correspondence of the Hartford Times:

"The labor-saving contrivances employed by the Pacific canneries are quite wonderful, nearly everything being done by machinery. The salmon are cut up by machinery, after being opened and cleaned by hand, and are put into the cans by machine, a single piece of mechanism filling 38,400 of the one-pound receptacles in a day. Some canneries have as many as four of these filling machines in constant operation during the season, with a proportionate output. One such apparatus consists of a platform on which the empty cans are placed and fed,

each one reaching a certain position in its turn. One man, standing overhead, feeds the cut fish into a hopper, through which the material is conveyed into the can beneath. By the gentle pressure of a piston it is forced into the can, whereupon a movement of the machine transfers the filled vessel to a table, an empty one taking its place. The movement is so rapid that a continuous stream of filled cans is poured, as one might say, upon the table, where they are inspected and weighed.

The cans, undergoing this test with marvelous rapidity, are next conveyed by a belt to another machine, which puts tops on them, crimping the edges firmly. Thence they pass to yet another apparatus, which solders them, and out of this they roll down a trough, beneath a series of water-jets, to cool. Tests for leaks follow, and then the cans are subjected to a cooking process in a steam "bath-room," as it is called. The cooking has to be very thorough. Not only must the fish be cooked, but the bones also, so that the latter will crumble between the fingers; for, if this is not accomplished, the contents of the can are likely to spoil. About two hours in the "bath-room" are required to secure this result.

From the view-point of one unacquainted with the business, the number of cans used in a first-class salmon cannery seems well-nigh incredible. Chinamen, who are largely employed in this sort of work because of their faithfulness and efficiency, arrive at the factory six or eight weeks before the fish begin to "run"—i. e., to arrive at the mouth of the river where the packing plant is situated. They employ this time in making "can-bodies," the tops and bottoms being left to be soldered by machinery. In 1898 the salmon pack utilized about 44,000,000 cans, which required for their manufacture 100,000 boxes of tin-plate, weighing 10,000,000 pounds and costing $400.000. Tin obtained from mines in America is largely used for that part of the pack which is sold for home consumption, but imported tin is required for the superior export goods for Europe.

As already suggested, the greatest danger to the prospects of salmon rivers lies in the practice, which is quite general, of barricading them, so that no spawning fish can ascend them. The origin of this practice dates back to a period prior to the acquisition of Alaska by the United States. The Russians built "zapors," or dams with stone piers, across the streams, near the settlements, from which they drew their salmon supply. The ruins of some are still standing. They doubtless

got the idea from the Indians. When the first fisheries for the canneries were organized these devices were in use, and in some instances were so ingeniously arranged that the fish were carried out high and dry into a basket. At one place an Indian owner of a river used to boast that his trap was so cleverly arranged that not a fish could get up the stream; that he caught them all. It is said that the Indians appreciated the necessity of allowing the fish to ascend the streams to spawn, and therefore, after obtaining their winter supply, they opened the barricades.

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IMPROVEMENT IN ORANGE CULTURE.

The Pacific Fruit World has the following in reference to an alleged remarkable discovery of Secretary Lelong, of the California Board of Horticulture. If confirmed here, it is a valuable discovery.

"Secretary Lelong, of the State Board of Horticulture, today announces the most important discovery of the board, and one which will mean millions of dollars to the horticulturists of the State.

"For many months past Secretary Lelong has been endeavoring to grow cuttings from different species of trees by grafting them on a foster mother root. Success has crowned his efforts, and he now gives the result of his work to the horticultural world. His discovery means in a nutshell, that you can take the limb of any kind of tree, put a foster mother limb in it, and in a very short time the limb will take root and become a tree.

"Limbs two feet long were taken from Washington navel orange trees and united with foster mother roots and placed in a sandy soil, and in 8 months they had attained a growth equal to two or three years by the ordinary methods. The same results were obtained from the olive, apple, peach and pear, together with other varieties of trees. As a result of this discovery Secretary Lelong says that our horticulturists will not have to wait five years for orange trees to bear, as they can probably be advanced to the bearing stage in one year from the operation. With olives the bearing time can be reduced from 4 years to 1 year, and the same is true of apples, pears and peaches. This will make an enormous difference financially to fruit growers.

"The same line of experiments has been carried on with ref-

erence to ornamental trees, particularly with the conifers. He has now on hand specimens of the Norfolk island pine and the Auracaria Bidwell pines, which were subjected to this process 8 months ago, and they are now two feet high or equivalent to 5 years' ordinary growth, and when it is noted that trees of that size are worth $2.50 apiece, the value of the discovery is apparent to all tree growers.

"Over 15,000 apple trees, consisting of a Northern Spy graft on a common root of resident stock to the pestiferous woolly aphis, have just been propagated and were shipped to prominent growers for general use under the new system.

"Speaking upon the subject to the Fruit World, Secretary Lelong said last Tuesday: 'We have not yet established the question as to the bearing qualities of trees produced in such a manner. It will take several years to do this. I feel quite confident that they will bear, but whether they will bear prolifically remains to be seen. It is, however, a very simple process, and will be fully described and set forth to the horticulturists of the State at a later moment.'"—Florida Agriculturist.

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A VALUABLE DISCOVERY.

The efforts recently made to find a better supply of artesian water on Molokai than was previously obtained, deserve more than a mere mention. The statement of the well borer is that the purest artesian water yet found in this group has been obtained on the dry western half of that island. What has been popularly supposed to be its most worthless part may yet become, by the help of artesian water, the most fertile and valuable. Little did those who were interested in the first efforts made twenty-five years ago, to ascertain whether any artesian supplies existed on these islands, (among whom was the writer of these lines), ever dream that such exhaustless reservoirs of the purest water were locked up under each of the older islands of the group, waiting only for the magic words "open sesame" to be spoken—to bring it to the surface and change the land from a barren wilderness to an evergreen plain. We congratulate those who have had an abiding faith in the possibilities of western Molokai, even when popular opinion was extremely doubtful regarding the project of making it a successful sugar venture. With this valuable discovery as a basis, the future of Molokai becomes brighter.

In this connection, we may suggest to the government authorities, that the opening of an artesian well at each end of the leper settlements on that island, and near the base of the pali or mountain, where the work would be most likely to prove successful, would be a god-send to the lepers. Although they have a supply now—which may at times give out—that desolate plain needs all the water that can be given to it, to start vegetation, as well as for the use of man and beast.

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COMMERCE OF THE UNITED STATES.

Advance sheets from the Chief of the United States Bureau of Statistics, furnish the details of the imports and exports of the United States for the fiscal year ending June 30, 1899.

The imports of merchandise were $697,116,854; the exports, $1,327,203,088; total foreign commerce in merchandise, $2,024,319,942, against $1,847,531,984 for the preceding year, being the largest yearly movement on record. Nearly 71 per cent. of the exports on merchandise were to Europe. In 1893 the exports to Africa were $5,838,687; in 1899, $18,594,424; to Asia and Oceanica, in 1893, $27,421,831, against $78,235,154 in 1899. These figures, as do those for Europe, show expanding commerce, but with South America our exports are about stationary, being only $3,000,000 more than in 1893, and less than in 1896. With Canada there has been a fair increase, the exports in 1899 being $157,931,409, against $119,788,889 in 1893. There must be something wrong in the National policy, when commerce with our nearest neighbors does not increase in as fast a ratio as it does with far-away nations.

Of the imports, 51 per cent. came from Europe; little over 16 per cent. from North America; 12½ per cent. from South America; little less than 20 per cent. from Asia and Oceanica; the balance from Africa and all other countries.

The character of the imports and exports by classes of merchandise, the percentage of free goods, and duties collected are shown in the following statement:

IMPORTS.

	1899.	1898.
Articles food and live animals...	$211,869,918	$181,205,844
Articles in a crude condition for domestic industry	221,998,377	201,428,375
Articles manufactured for use in mechanic arts	60,712,518	58,584,559

Articles manufactured for consumption	108,621,406	97,382,404
Articles of voluntary use, luxuries, etc.	93,914,635	77,448,472
Total imports	$697,116,854	$616,049,654
Per cent. of free	43.07	47.3
Duties collected	206,507,812	149,819,594

DOMESTIC EXPORTS.

	1899.	1898.
Products of agriculture	$ 784,999,009	$ 853,683,570
Products of manufactures	338,667,794	290,697,354
Products of mining	28,832,547	19,410,707
Products of the forest	42,316,779	37,900,171
Products of the fisheries	6,025,446	5,435,483
Miscellaneous	3,281,134	3,164,628
Total domestic exports	$1,204,123,134	$1,210,291,913
Foreign goods re-exported	23,082,285	21,190,417
Total exports	$1,227,205,419	$1,231,482,330

The net imports of gold were $51,432,517; net exports of silver, $25,643,999, so that silver is constantly being exported and gold imported, showing that the world's demand for silver is still very large.—American Grocer, September 1.

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LET THE "SUGAR TRUST" MAKE BEET SUGAR.

An important fact appears to be overlooked when discussing "The Sugar Trust's" shortcomings, viz.: That they have within their power the capital to purchase controlling interest in many of the beet-sugar factories already in existence in this country. Have they not already made a move in this direction in California? It appears to us upon general principles that if the sugar refining company would let protection stand as it now is, and follow the example of several French refiners we could mention, and make beet sugar to meet within reasonable limits their actual demands for raw sugar they would render a service to themselves and to the United States. Under proper management and inventive organization they could produce a raw sugar that would meet their economic requirements. Low wages of Germany may work wonders for

the time being, but Yankee brains will be equal to the emergency. Continental bounties allowing exported sugar to be sold in foreign markets below cost may sometime in the near future be withdrawn, where would the Sugar Trust then be? As time progresses, the American beet sugar manufacturers will form a "combine," and certain indications show that period is not far off. Two hundred beet sugar factories forming a syndicate would represent an organization more powerful than any attempt of the same kind ever dreamed of in America. In Russia, etc., this is already a reality, and they by proper understanding with their respective governments may control their markets and prevent over production.—Sugar Beet.

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ENLARGING HONOLULU HARBOR.

In the Hawaiian Star of August 7, reference is made to a plan for the enlargement of our harbor, as suggested by Capt. Merry, of the U. S. Navy, in a brief interview. The views of a naval officer of his experience should command the attention of the government authorities, both of Hawaii and the United States, by one of which it must eventually be undertaken, as the time is rapidly approaching when the large trans-Pacific steamers of eight or ten thousand tons, and six hundred feet or more in length will demand accommodations for the quick despatch of their cargoes and coal, Capt. Merry says:

"I would begin dredging at a point two or three hundred yards beyond the lighthouse," said Commander Merry, speaking of his plan, "and enlarge the harbor all the way round. A retaining sea wall might be built at the present drive to the quarantine station and deep dredging there is only soft mud. This wall should extend around westward and the mud pumped out would reclaim a large acreage of land that has a coral reef foundation. Where I propose dredging there is only soft mud. This would mean the moving of the Oahu railway tracks and station northward, the terminus being at wharves that might be constructed on the opposite side from our present wharves. Sugar from Oahu plantations could then be carried by rail to the wharves. The Oahu road should never have been laid where it is. Instead of attempting to fill in such marsh as this, we should dredge and enlarge the harbor. Several mistakes have been made along the front, in my opinion, in filling in places that should have been dredged.

"I have not made any calculations as to the cost of this work, but, of course, it would be very large. I think, however, that the land reclaimed, which would be very valuable, would be worth in a short time not only enough to pay for the work, but a great deal more."

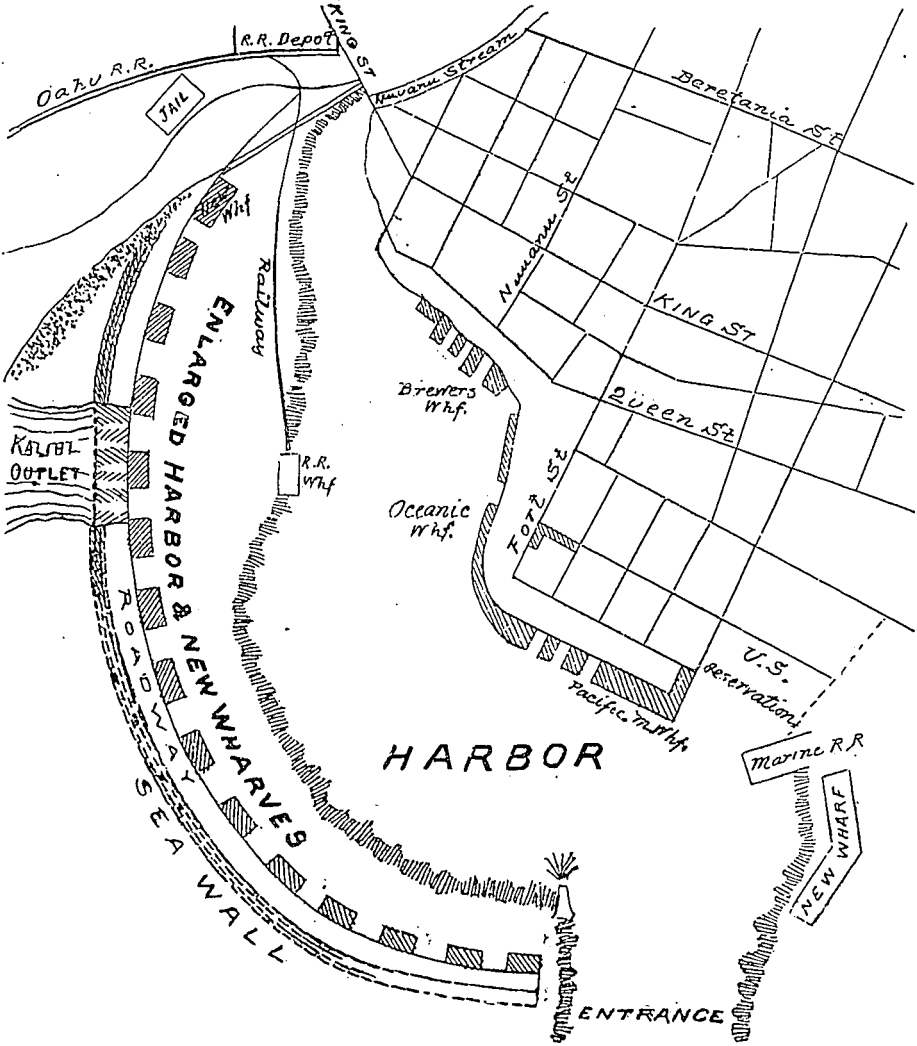
The views expressed by Capt. Merry are practically along the same lines as those given by the editor of the Planter's Monthly in the issue of February 1899, which we reprint below:

"On the makai or westerly side of the harbor, which still remains as it was when discovered in the early years of the present century, there is abundant space for wharf construction. Access to it may be had by opening a macadam road from King street, one hundred feet wide, along the base of the Iwilei bluff on which the prison stands, then bridging over a space of three or four hundred feet to allow the ebb and flow of water to and from the Kalihi basin, if this be deemed necessary. From this bridge on, new wharves may be constructed without interruption to near the present lighthouse, which might be removed 400 or 500 feet farther down the channel. The coral stone, mud and sand excavated for construction purposes, would all be needed in these improvements, and for a broad roadway, running makai of the wharves the entire distance from the harbor entrance to King street. The length of this road would be nearly or fully one mile. Instead of a series of piers, it may be deemed best to have a circular quay, though the latter would furnish only one-third of the wharfage that piers would give. Should lava rock be encountered in the construction work, such places might be made into piers. The general belief is that the entire reef consists of coral rock, easily worked with modern appliances. The area reclaimed for wharf purposes would probably be from three hundred to five hundred feet in width, the entire distance from the Iwilei bridge to the harbor entrance.

"The roadway back of the new wharves should be made broad —perhaps one hundred feet in width, planted on the outer edge with palms or other trees that thrive in salty localities. This, in time, might become a favorite drive or promenade. Outside of this roadway a sea wall should be constructed, rising two or three feet above the level of the road, to serve as a protection in case of high tides or southerly gales—similar to the wall at Waikiki, just before the entrance to the park. No reference has been made to the title or ownership of the reef, which should be the property of the government. If it

is private property, the sooner that the government acquires the title, the better for the public interest, as well as for the future trade and prosperity of the islands."

The article of which the above is a partial reprint, was accompanied by the following map showing the proposed enlargement, and the area which would be reclaimed from the sea by dredging.



THE MYSTERY AND MASTERY OF IRRIGATION.

By T. S. Van Dyke.

A common way of making "borders" is by throwing up ridges with a plow. Where ground is very nearly level two such furrows run in opposite directions and throwing the earth together may do for temporary checks. Occasionally ground is so flat that one will do. Stubble is often wet in this way to prepare it for plowing. And very often it is good enough to prepare new ground for plowing. But it is generally best to do the first plowing on ground wet with the rains. And in a desert country the soil will generally be so loose that it can be graded almost as easily dry as wet. Even for the first plowing grading should not be neglected if it can conveniently be done. Some bumps are almost certain, and sooner or later they should come off if you have any crop of value in the ground. And the same is true of depressions. They can rarely be filled more conveniently than at first.

If ground has been properly prepared there is enough loose dirt to make a good ridge as cheaply as a bad one, and you are then sure the water will not escape and yet be deep enough to soak well. Anyone can make a scraper good enough for this. A "ridger" is a box sled with runners of solid plank converging at one end and diverging at the other. The openings vary with the ease of scraping the soil and with the size of the ridge. One five feet long with the openings a foot at one end and three feet at the other will make ridges strong enough to hold water five inches deep if the soil is in good condition to scrape. By dragging the ridger with the large end forward the work is done as fast as a team can walk. If not heavy enough it may be weighted. Often it is well to have a larger one running in front to gather earth and a smaller one behind to concentrate it. Heavy clods and flakes make ridges leak so that the soil should be well harrowed.

Where checks are to be permanent they may often be made well enough with this ridger. It may have to be larger and run over the same ridge several times; but enough soil can be gathered in that way for low ridges. They can then be rolled into shape with a heavy roller. They must be broad at the base and round on the top, so as to be easy to drive over as well as avoid cutting. Grain, grass or whatever is in them is planted upon them and grows as well as anywhere. For if

they are not too high the moisture will rise in them or the roots will go down to the moisture needed. Where there is much slope and very large checks are needed it takes so much earth to make them broad enough that some sort of a carrying scraper is needed. This work needs care, for such ridges may remain for years. If properly done, they will need little touching for a lifetime and will add much to the value of the field if you want to sell.

When made with a ridger there will be openings at each junction of a ridge with another. These have to be filled with a hoe. But it is not as much of a task as it would seem, and on some ground you can so arrange the lines as to use these places to let the water from one check to another so that they require no very careful filling.

More havoc can be made in flooding than in furrow work by not having everything ready and not understanding detail. I may seem unnecessarily particular, but I have probably seen more of it than any reader, and seen more ruin and disappointment by it than by all other ways combined. If badly done nothing makes a stranger so quickly think the land worthless. A piece badly checked and badly flooded is about the hardest thing to sell to one who doesn't know just what is the matter; while one who does will discount your price by much more than the cost of putting it in shape. Flooding is the leading system of the world for heavy work, and always will be; but never is it so foolish to underrate the strength of the enemy as when trying to win victory from a dry soil by any plan of flooding. Yet when done right there is no way of handling water on a large scale so cheaply, while for many products it is quite as effective as furrows.

The head of water is to be divided among as many large checks, or tiers of small ones, as can be conviently managed. If the stream is large for the number it will keep you too busy to hold it, and if small, your hired men will lean too much on the hoe. By trial you will soon arrange this, and also learn when and where to cut the checks, while all else that looks so troublesome at first will be very simple when once you have the ground well graded and checked.

Checks are generally fed from one ditch along the upper line, but it is often well to have it run down the center, feeding to right and left. The main trouble in such case is to empty the checks fast enough without wasting water. Where one feeds another there is little waste. In all cases the ditch must

be high enough above the bottom of the basins to insure rapid flow.

The time required to soak the ground will vary with the soil. Soil of average texture should be well soaked in three hours after the bottom of the check is covered. If it takes much longer it is probable that furrows would be better. For if too fine the baking will be worse, and if it takes too long to soak there is danger of scalding tender vegetation, when the water is very warm with sun and air hot.

Where the soil is very coarse it will often soak enough in half an hour, and even less. And soil that is fine enough to work at all may be flooded, though furrows may be better. But the coarser the soil the smaller the checks must be, and the water must be sent over it more quickly in large heads.

Where upper checks feed lower ones it would be supposed that the upper part of the field would be much wetter than the lower. Little difference can be seen where the work is well done. It is not difficult so to arrange the breaking of the borders that the water will remain longest in the lower checks.

Flooding may be used for every variety of vegetation, garden and fine flower work. It is the simplest thing to lay out a lawn so that one good flooding every two or three weeks that will take almost no trouble, will make as fine a lawn as the best sprinkler, be just as clean, and in case of neglect, or shortage of water, go ten times as long without suffering, as where the small roots are held at the surface by a daily sprinkling that only wets an inch or two.

Where it can be done without too much trouble the water should be kept away from the stalk. The same applies to plants in furrows, but there it is more easy because they may be set on a ridge which the water ascends only in moisture. With many plants and vegetables it is not easy to keep water from the stalk in flooding, though trees may be easily left with a mound about the trunk. Where the stem is exposed on tender plants water should be spread quickly in the thinnest sheet that will do. And if possible do it late in the afternoon or evening so that the ground and stem may be dry by the time the sun strikes them in the morning.

Plants differ much in their ability to stand baking of the ground and the scalding of the steam by having the hot sun strike it while wet. As a rule little harm will be done if the water is not allowed to stand around the stalk too long or too hot a sun allowed to strike it when the water is first taken

off. In cloudy weather there is little danger. But never run any risk where you can as well avoid it.

With young grain, alfalfa and many other things just starting, some loss is almost certain to follow flooding, no matter what the sun or weather may be. There are few if any soils that will not bake enough to damage the plant when very young, although when old almost anything will endure a great deal of it. Where you can have a long run of a large head of water you can easily remedy this. And if you have not such a head do not try to start such crops by flooding. Fill the ground so thoroughly with water before planting that the plants will run on the moisture in the ground until old enough to stand baking. Even if it takes two or more floodings to do it, have the ground thoroughly soaked, then well plowed and harrowed. It will then retain enough moisture to carry almost anything until old enough to endure baking. In many countries you can make very deep irrigation carry the plants for two months, and often mature the whole crop. In the Cocopah country in Lower California, the hottest and dryest part of North America, one good flooding from the Colorado River matures a crop of corn, pumpkins and many other things which the Indians plant with a stick. This soaking is especially important in planting for the first time a piece of desert ground that has never been thoroughly wet. In such cases the sub-soil will be so dry that repeated watering will be needed to wet the whole, so that it will be a long time before any more water is needed. You can make no greater mistake than to plant such a piece with an ordinary wetting and then flood again as soon as you find the young plants wilting. Rain to the crop is almost certain and it will look as if the land were to blame and not yourself. This loss is different from scalding. Scalding injures old plants as well as young ones, but is apt to do it only when the sun and air are very hot, the water of high temperature, and left on too long. But very slight baking kills some tender stuff at any time of the year, and even with a very short period of standing water upon it. And much of what is not killed is stunted. The great problem in flooding is to make a number of checks feed each other without having the water stand too long in any of the upper ones, or running so fast as to cut the next one, carry sand into it, or wash away the crop; yet at the same time use up the whole head so as to have little or none to waste at the lower end. This is not easy, but you can work it out. You must recognize the diffi-

culty at the outset and study it. If the checks do not feed one another, you have the expense of more laterals and gates and more care in watching each check, so as to give just enough water to soak away quickly and no more. If there is a waste ditch at the lower end, so as to empty all that line quickly, and you see that it is done, then you might as well have one feed another at once.

[NOTE. The above is one of a series of articles on irrigation, in the California Cultivator, and is as applicable here as in Southern California.]

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NO RELIEF FROM TRUSTS.

Trusts exercise a strong hand in shaping legislation at the present time, and it seems to be almost hopeless for men of small means and influence to fight them. An intimation comes from Washington that the industrial commission created by the last Congress will not recommend legislation touching the regulation of combines. A man prominently connected with the commission in a recent interview declared that the commission cannot recommend any legislation against the trusts or declare them unlawful. He avowed that they are formed for the purpose of cheapening production, controlling prices and regulating the output of various commodities. He thought that this could not be declared illegitimate according to the universal laws of trade; that the formation of trusts was merely the outgrowth of new business conditions in the country.

The probabilities are that unless some strong action is taken in the direction of suppressing the trusts by the government the matter will cut a very important figure in the next election. There is such a growing hatred of trusts throughout the country and such a tremendous opposition to their aggressions that there will be a big fight when the matter comes before the people, who will be heard from in no unmistakable way.

The army of the unemployed is constantly increasing; even the commercial travellers have lost good places and are walking the streets in idleness, unable to obtain employment—men who a few years ago commanded almost any price they asked for. They, like many others, think the time has come when men should act for their own protection against having their wages lowered, their usefulness curtailed and themselves forced to change avocations in which they have been engaged

for a long term of years and in which they have become experts.

It is all bosh to assert that trusts are a benefit to the country or to anyone in the country, except to those who promote them and manage them for their own enrichment and profit. Organizations are springing up all over the country in opposition to combines, and it seems strange that the industrial commission should be so indifferent to the demands of the people.

A gentleman who has been looking up the subject of trusts very carefully, says that on the 5th of June more than $1,000,000,000 was consolidated in the formation of new trusts. As the valuation of all properties in the United States is less than $6,000,000,000, one-sixtieth part of the entire wealth of the country was absorbed in one concern in a day.

We are making history at the present time. Poverty is more destructive to life than war. The trust is the thief of small fortunes and the promoter of poverty. This cruelty is only equaled by its indifference to human interest and want. No free republic can long exist where trusts predominate and control the distribution of wealth.—Grocer's Criterion.

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THE NATION'S HARBOR.

[In connection with the proposed improvement of Honolulu Harbor, the following article relating to the improvement of New York Harbor will be read with interest. This is a matter that concerns our growing sugar interest. ED.]

Practically the harbor of New York is the great port of entry for the United States. There is not a merchant in the interior, a farmer on the plains or prairies of the West, or a planter in the South who has not a direct personal and pecuniary interest in the harbor of New York. Whatever tends to restrict its development or impair its advantages works injury to the agricultural and commercial interests of every section. And yet New York has had to fight for years to obtain the aid of the Federal Government to do for the harbor of New York a mere fraction of what it does for the creeks, rivers and harbors of the interior. At the last session of Congress an appropriation was made to secure a better entrance to the harbor, such as would permit of the largest steamers afloat entering the port of New York. This favorable action was largely due to the laborious and long-continued work of Senator Frye, of

Maine, aided by Senator Platt, of New York. In recognition of Mr. Frye's "common sense and stubborn resolution" and success, the banking, shipping, and commercial interests of the city tendered him a banquet, which was held at the Waldorf-Astoria on last Wednesday night. It was there for the first time that public recognition was also made of the labors of John W. Ambrose, of this city, whose persistency and intelligent advocacy of harbor improvement Senator Frye stated were largely instrumental in securing the appropriation for New York's harbor, which it should be the ambition of our people to make the best equipped and most accessible in the world.

Mr. Ambrose, in his speech, brought out many facts which ought to be familiar to every producer, transporter, and distributor in this broad land. After recounting the selfish and formidable opposition encountered by the friends of the measure, he said:

The quantity of material to be taken out of the Sandy Hook and Brooklyn Shore channels is 70,000,000 cubic yards.

The total expenditures by the Federal Government for all the rivers and harbors of the country up to the present time is $350,000,000, of which only $6,000,000 has been expended at this port, which is only 1¾ per cent. of the total expenditure, or 1¾ cents expended at the port of New York and 98¼ cents in the rest of the country.

Larger channels mean larger vessels, and both always mean reduced freight rates to the producer and consumer. Half a century ago, taking the Cunard and Collins Lines as specimens, the ships were so small, their hulls and machinery so ponderous in proportion to the size, and their consumption of coal so prodigal, that of their entire weight 10 per cent. only consisted of cargo. In other words, a vessel which when loaded weighed altogether 3,000 tons would carry but 300 tons of cargo, the rest of its weight consisting of hull, machinery and fuel, while at that time one pound of coal propelled one ton of ship, machinery, fuel and cargo a distance of only ten miles. Today, of the entire weight of a large vessel when loaded, 55 per cent. consists of cargo, and the balance of hull, machinery and fuel. Now one pound of coal will propel one ton of ship, machinery, fuel, and cargo a distance of forty miles, so that one pound of coal in the big vessel of today will propel the same weight of ship, machinery, fuel

and cargo at the same rate of speed four times as far as it would fifty years ago.

Considering cargo only, with the kind of vessels and motive power then used, six tons of coal were required to propel two and a half tons of freight across the Atlantic, while in the big ocean liner to-day only one-seventh of a ton is required.

It has long been established that there is an economic value in mere bigness. This is in conformity to a law of physics well known to naval architects, but not generally to the public, who do not understand the vital bearing that it has on their commercial interests and welfare.

When the first application was made nine years ago, the chairman, upon introducing me to the committee, as representing New York, made the surprising statement that New York had received $4.50 out of every $5 which the Federal Government had expended on river and harbor improvements since it had become a Government. I made an exhaustive study of all river and harbor appropriations for one hundred years, and ascertained that the Federal Government had expended a total of $296,000,000 in the whole country, of which only $4,047,000 had been expended for channels at the port of New York. In other words, only $1.50 had been expended at the port of New York out of every $100 expended in the entire country.

Notwithstanding the intrinsic merits of the New York projects and their vast benefits to the entire country, they have been brought to success only by years of most laborious study and harassing labor, and in the fact of tremendous opposition.

Senator Frye alluded to the great resources of the United States, in part, as follows:

God scattered His gifts with a prodigal hand—over ten thousand miles of sea coast, equipped with fine, capacious harbors; twenty-three thousand miles of navigable rivers; great lakes, holding more than one-half of the fresh water of the world, located just where commerce seemed to require them; boundless forests; mountains of iron; coal enough to supply the world; gold, silver, copper—indeed, all the metals and minerals man requires; a fertile soil; a climate so friendly that we can produce every manner of fruit and grain.

These gifts were bestowed upon intelligent, resourceful men, who made fairly good use of them. Since the close of the Civil war, our progress has been the marvel of the world. We have outstripped the nations in agriculture, in mining and manufacturing. Our growth in wealth and population has

surpassed our wildest dreams; our home market become the best on earth, actually absorbing almost our entire product. This operated in one respect to our disadvantage; it tempted us to contentment, induced us to neglect foreign markets, their requirements and necessities. When, through a bitter experience, we learned that our product was a third larger than our consumption; that our surplus would surely increase year by year; that we must have a foreign market, or, crablike, progress backward, we found ourselves face to face with a most serious problem. Our commercial rivals were strongly entrenched everywhere; with subsidized steamship lines entering all the great ports of the world, with banking facilities, business agencies long established, and a thorough acquaintance with trade requirements.

What of our future? Our success last year is most gratifying, but our necessity for foreign markets is certain to increase. Our wonderful inventive genius, the brain power of our workingmen, our present and prospective machinery, the sagacity, enterprise, and skill of our manufacturers, all promise still greater advance. In a few years we shall have a population of one hundred millions. What shall this increase do? Farm? Only a small percentage; for now we produce enough for our own, and can supply the necessities of Europe, while Europe is steadily increasing her agricultural acreage, rendering her dependence upon us less and less. It is safe to say that sixty millions of our people will in that time be dependent upon non-agricultural pursuits.

The commercial war upon which the world has entered will become fiercer and fiercer. Germany will be our most dangerous rival. Her wages paid are not one-half of ours. Shall we reduce ours to the plane of hers? That might breed a discontent which would endanger the Republic; would certainly reduce the purchasing power of our people, and still more increase the surplus. Shall we run our mills on one-third or one-half time? That would reduce our purchasing power and largely increase the cost of our product. I do not believe that our railroads can reduce freights much unless a new motive power is found, but our water carriers can, and probably will. Freight ships will be increased in carrying capacity and rates still further reduced. Let me illustrate the effect of such increase.

When the largest freighter was 3,000 tons, the rate across the Atlantic was $8.50 a ton; when 6,000 tons, $6.00 a ton;

when 8,000 tons, $3.50 a ton; when 10,000 tons, $2.50 a ton.

All the necessary facilities for these deep-draught ships must be provided for. It was just a look into this future which compelled me to insist, even to the point of obstinacy, that $7,000,000 should be expended in New York harbor, and that our ships should find there a channel 2,000 feet wide, with a depth of 40 feet, and ample dockage room. I trust, too, that the time is not far distant when we shall have a deep waterway from the Great Lakes to the Atlantic Ocean, still further increasing our facilities and decreasing our rates.

When voters realize that great public improvements are National and not local, when politicians adopt the policy of the late President Hayes, that "He serves his party best who serves his country best," then it will not require long years of persistent work with Congress to pass measures which tend to keep the United States well ahead in the race for commercial supremacy.

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THE PROPAGATION OF PLANTS.

Plants are propagated by seeds, cuttiugs, division layers and grafting. In all these operations great care and attention is necessary to be uniformly successful, as required by a commercial establishment. The amateur need not be discouraged by this fact, as he can start many more seeds or cuttings than he desires, so if a great many fall by the wayside he will still have enough left for his limited requirements.

The sowing of many kinds of seeds is so simple that little instruction is necessary, for they are bound to grow, while others are so fragile that they need the utmost coaxing and nursing. The vitality of many seeds is remarkable. No doubt everyone is familiar with the story of the grains of wheat found in the Egyptian mummy cases; it is said they germinated and grew after lying dormant for thousands of years. Of course this could hardly happen in any other climate than that of Egypt, although maize has been known to grow that was found in the tombs of the Incas. Seed will not sprout and exhaust itself if situated at any great depth below the surface, even though the soil is moist. Earth has been found to produce plants taken from excavations fifty feet below the surface and immediately covered with glass and away from any possibility of receiving seed floating in the air.

Some seeds sprout in a few days while others, under the

most favorable conditions, lie dormant for some years before germinating. Out of a planting of Persian Iris a few came up in one year, and the balance did not appear until six years later. Job was a good man, but I doubt if he ever planted Iris seed.

Moisture and temperature are the two leading factors to bear in mind in growing seed. Little or no light is required. The soil comes next in importance. At first it only acts as a medium to support the seeds and to convey sufficient moisture to them. For a short time the seedling needs little nourishment from the soil, so the surface of the soil requires little fertilizing material. If the seedlings are to remain some time in the germinating box or pan, fertilizing material can be added to the lower strata. This fact allows us to sow some varieties of seed directly in fine sand, especially those that lie a long time and would be likely to decay if in contact with organic substances. The ideal material is leaf mold or fibrous peat mixed with a small portion of sand. Press the soil down firmly and level. If possible prepare a sufficient number of boxes or pans to allow the seeds to be sown some distance apart, which will disturb the roots less when transplanting, and allows more space for air to circulate among seedlings. The larger seeds may be covered over with fine soil from one-sixteenth to a half inch in depth. This should be firmly pressed down and made level. It is understood that the soil should be just a little moist at this stage; it may now be watered with a fine sprayer which will not have force enough to remove the covering and wash the seeds about. For the very fine seeds, such as Begonias, Petunias, and for spores of ferns, etc., firm the soil down and sow directly on the surface without adding any covering of soil, which should have been previously moistened, and when any additional moisture is required immerse the bottom of the pan or box in water and it will soon be drawn up by capillary attraction, the water entering at the drainage holes. When seeds are planted on or near the surface they should have a covering of glass, especially if in the dry dwelling room. This should be a couple of inches above the soil, but as soon as the seedlings appear the glass must be raised for ventilation and finally removed. In a moist greenhouse this precaution is hardly necessary, unless for ferns. In all cases the young seedlings must be shaded from the direct rays of the sun by a newspaper or other heaving shading on the glass.

A convenient and sure method is to fill a large pot loosely with spagnum moss and press a much smaller pot into the center, until the rims are flush. The center pot is filled with good, fine soil, in which the seeds are sown, and the water is applied to the moss between the pots. Enough will seep through to nourish the young plants. This keeps the soil always moist, but never wet. Another simple method is to set the pot in a shallow saucer containing water.

Dry seeds will usually stand a great range of temperature, but for favorable results the temperature should vary very little after the seeds are moist and starting to sprout. Keep them five to ten degrees warmer than the proper growing temperature of the plant, from 60 to 80 degrees, according to variety. After seeds have germinated and a leaf appears, remove to a cooler locality and in bright light; also at this time give careful ventilation, supplying all the fresh air the plants will stand. This is for the purpose of making the plants stalky and to prevent "damping-off."—Ex.

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FERTILIZER LEGISLATION IN THE UNITED STATES.

A subject of very great importance to the agricultural community is under discussion in the United States. We should be very glad to see it taken up also in Great Britain and in India. At the last meeting of the United Planters' Association of Southern India allusion was made to the fact that planters have some times to try artificial fertilizers almost in the dark. In some instances, there is a statement of the component parts of an artificial manure, but no guarantee; and where there is a guarantee, it is often misleading, because put at such a very safe level as to give scarcely an approximate idea of the availability of nitrogen or potash or phosphoric acid in the fertilizer. In America, where artificial manures are very largely used, this difficulty has attracted considerable notice. The Association of Official Agricultural Chemists and the Association of American Agricultural Colleges and Experiment Stations lately appointed Committees to confer together on "uniformity in fertilizer laws." In a state composed of many states, each with its own form of laws, there is always a tendency for these to differ materially, and it is not surprising that, now that America has begun to recognize the need for legislative uniformity, this particular subject of laws relating to fertilizers should have come under consideration. If

surprising at all, the action taken will be wondered at simply because it has been taken so late.

From the recommendations of these Joint Committees a great deal may be learnt that might be of the utmost service to law-makers in Great Britain and in India. The recommendations run upon lines that might also furnish a good guide to the adoption of a sound law as to the Adulteration of Foods and Drugs, for the Joint Committee has manifested a tenderness as to the ingredients of plant-foods that even American legislators have not yet shown with respect to the articles of human food and drink that are publicly offered for sale. The main recommendations of the Joint Committee are that all substances containing nitrogen, potash or phosphoric acid, sold, offered or exposed for sale for manurial purposes, excepting the dung of domestic animals when sold as such, should be subjected to inspection. An important omission from the exceptions is nightsoil, unless the "domestic animal" phrase is vastly comprehensive. Each package of manurial substances (as above deposed) sold, offered or exposed for sale, should bear a printed, legible guarantee, a statement of net weight, the brand, name or trade-mark, the name and address of the manufacturer, and a note of the percentages of the manurial ingredients. As regards inspection, it is suggested that: (1) The guaranteed statements on the packages forwarded to the Inspectors need not be in the form of an affidavit. (2) Sealed samples of fertilizers offered for sale need not be sent by the manufacturers to the Inspectors. (3) In lots of five tons or less, samples should be drawn from at least ten packages, or if less than ten packages are present, all should be sampled; in lots of over five tons, not less than twenty packages should be sampled. Duplicate samples should be drawn and sealed in the presence of the party or parties in interest, or their representatives, one of the samples to be taken by the collector and the other left with the party whose goods were inspected, subject to the call of the manufacturer. When examinations are made, it is recommended that the methods of the Association of Official Agricultural Chemists be used, and the following miscellaneous recommendations also find a place in the Joint Committee's report: —An imprisonment clause for violation of fertilizer laws should be omitted. Manufacturers should not be obliged to secure bondsmen. Commercial valuations should not be affixed to the published analyses of manurial substances. A

definition of the term "brand" should be inserted wherever a brand-tax is assessed. It will be seen from this that the rights of the fertilizer manufacturer have been considered, as well as those of the agriculturist.

Among the recommendations under reference are also sundry items stating what the manufacturer should be called upon to guarantee, and here, too, almost absolute uniformity is wisely aimed at. The chief points are as follows:—Total nitrogen should be guaranteed in all cases, and nitrogen in the form of nitrates or of ammonium salts should be guaranteed separately, if the manufacturer desires credit therefor. Total phosphoric acid should be guaranteed in all cases, and soluble, reverted and insoluble separately, if the manufacturer desires credit therefor. Potassium should be guaranteed as potash (potassium acid) soluble in water. When chlorine is present in fertilizers, manufacturers shall guarantee the maximum percentage thereof. In other cases than that of chlorine, only statements of the minimum amount of the substances present shall be given. For instance, instead of guaranteeing from 2 to 4 per cent. of potash, guarantee should read this: "2 per cent. of potash." The guarantee should state the ingredients guaranteed in the following form and order:

" .. .. per cent. phosphoric acid soluble in water.
" .. .. per cent. phosphoric acid reverted.
" .. .. per cent. phosphoric acid insoluble.
" .. .. per cent. phosphoric acid total.
" .. .. per cent. nitrogen in nitrates.
" .. .. per cent. nitrogen as ammonia.
" .. .. per cent. nitrogen total.
" .. .. per cent. potash soluble in water.
" .. .. per cent. chlorine.

Ingredients not present should be omitted for the guarantee, and no other form of statement should be interpolated. —Planters' (India) Opinion.

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FUTURE OF CUBA AND PORTO RICO.

All the reports that have thus far reached us from Cuba and Porto Rico indicate that those islands contain some of the richest soil to be found in this country. Their climate, too, is one of almost perpetual Summer. The sunshine and rainfall is ample to mature crops in any season, and by rotation they can produce three or four crops a year. Both the soil and climate

are admirably adapted to the production of nearly all kinds of tropical and semi-tropical fruits and vegetables. Oranges, lemons, pineapples, bananas, plantains, guavas, Japanese persimmons and many other tropical fruits can be purchased in profusion.

Fruit raising is found to be one of the most profitable industries to which any soil can be devoted. Many of the orchards in California annually produce from $300 to $600 worth of fruit to the acre. Next to fruit culture for profit comes the raising of garden vegetables.

It takes more acres of land to produce $100 worth of live stock than it does to secure that amount in money from any other farm product. Next in order comes dairy products, then the cereals, vegetables, fruits, berries, etc.; that is, it requires less land to raise $100 worth of berries than of any other crop. There is only a small proportion of the United States on which tropical fruits can be raised, while the market for them is almost unlimited, and such fruits are among the most healthful, as well as the most profitable, that can be produced. Although sugar cane grows luxuriantly in Cuba and Porto Rico, yet sugar beets from which can be made as fine a quality of sugar, can be successfully raised in almost every State in the Union, and that industry is just beginning to be established in the United States.

If Cuba should become a province of the United States, we can well afford to have open ports for all her products that do not compete with those which we can now produce in abundance. Let Cuba and Porto Rico devote their land to tropical fruits and fresh garden vegetables for Winter supplies, which is more profitable to them than sugar making, and the United States will supply them with beef and other animal products, together with wheat, flour, corn and other cereals, with apples and the hardier fruits, and with manufactured products of all kinds. Those islands, with the Philippines, should supply us free of duty with such products as we need that do not materially come in competition with our own products. Coffee, tea, spices of all kinds, dyewoods and numerous other necessaries which our soil and climate are not adapted to, should be obtained from these islands, while we supply them with those things that are not indigenous to their soil and climate.

If a tariff of 2c a pound is kept on sugar in 10 years this country will produce all the sugar our people use, and the industry will keep in this country to distribute, largely among

our farmers and workingmen, more than $150,000,000 of our money that would otherwise be sent abroad and go into the pockets of the farmers and workingmen of foreign countries. By a reciprocity of that kind those islands will be of immense value to us, and they themselves will be equally benefited.

Cuba and Porto Rico will soon become very desirable Winter resorts for the residents of the United States who want to escape the rigor of our northern climate, and hundreds of thousands will flock there. On the other hand, many thousands of Cubans and Porto Ricans will spend three or four months of the Summer in our northern cities to escape the intense heat of their Summers.

Millions of capital will soon find its way from our cities to those islands to gridiron them with railroads, trolley cars, telegraphs and telephones, to develop their agricultural and mineral resources and to build up a valuable trade and commerce.

All countries should seek to establish such industries as will keep all their people at work to their own best advantage and the advantage of those with whom they are connected. "The wealth of a nation is the product of labor, or of the earth secured by labor," and if we can establish trade with colonies that have a soil and climate capable of producing desirable products which ours will not produce, and if at the same time we can supply them with products of which we have a surplus and which they cannot produce, we are securing the most valuable commerce we can obtain, and we can thus well afford to have full reciprocity of trade, and all parties be mutually benefited.

It was a favorite maxim of the venerable Peter Cooper that "We can buy nothing cheap of foreign countries that must be bought at the expense of keeping our own good raw material unused and our own laborers unemployed." If the truth of this maxim was stamped indelibly on the minds of our people, the results would soon become apparent to all.—New York Commercial.

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With the view to encourage sugar consumption, many wealthy manufacturers in Germany, when called upon to contribute to charitable institutions, simply send sugar loaves or syrups instead of money. Those who eat them enjoy the luxury, and frequently indulge in them long after leaving the hospitals.

TECHNICAL EDUCATION IN GERMANY.

German tradesmen and manufacturers are alive to the importance of increasing the efficiency of their mechanics and artisans and improving the quality of their goods. They are resolved that "made in Germany" shall no longer pass as a term of opprobrium, but be a synonym of excellent materials and good workmanship.

Yesterday there took place in this city a meeting likely to exercise a very important influence in this direction. It was in the nature of a conference, under governmental sanction and direction, to discuss German trade and manufacturing interests and to devise plans for their extension and improvement. It was held at the instance of the Prussian Minister of Trade and Commerce, and was presided over by the Oberregierungs President of the province of Hanover, Count Stollberg. Representatives of the Government from Berlin, the highest officials of the Hanoverian provincial and municipal administrations, leading manufacturers and business men, and delegates from the chamber of commerce, the manual training and artistic trade schools, and from the workingmen's trade unions, attended and took part in the deliberations.

As a result of the conference, it was unanimously resolved—

(1) To establish at once in the city of Hanover advanced lecture courses, in which artisans and apprentices in all trades shall have an opportunity to complete their mechanical education and be instructed by experts how to install and manage a model workshop and work and use machines and tools to the greatest advantage. Instruction will also be given in bookkeeping, the making and rendering of accounts, the making of estimates of the cost of work and materials, how to conduct business correspondence, drawing, and other practical branches.

(2) The oversight and control of the said lecture courses shall be under the direction of a commission composed of representatives from the imperial, provincial, and municipal administrations, the chamber of commerce, the manual and art schools, and from the trades unions.

(3) The first courses of lectures will be to cabinet-makers, locksmiths, shoemakers, and tailors. Those to other trades will follow.

(4) A fee for tuition will be exacted from mechanics able to pay, but those unable to pay will be instructed free. Funds

for the payment of the tuition of the poor will be provided by the Hanover provincial and municipal governments.

(5) Only mechanics and apprentices will be admitted to the classes whose theoretical and practical knowledge is such as to give promise of success as students. The commission has power in all cases to decide as to qualification of applicants for admission.

(6) Teachers are to be selected by the commission and confirmed by the Minister of Trade and Commerce.

(7) The cost of the establishment and maintenance of the lectures is to be supplied by the General Government and the province and city of Hanover, together with the trades unions, the chamber of commerce, and others interested therein.

(8) It is further intended that great care shall be used in teaching apprentices how to obtain the most practical advantages from the knowledge acquired by them in the classes. To this end, the creation of workingmen's co-operative societies is to be urged.

(9) A permanent exposition of all power machines and tools used in the small trades is to be established in the Gewerte-Halle (Industrial Hall) at Hanover. The machines exhibited there are to be worked by competent mechanics, who, on request, will exhibit their uses and management to all inquirers.

In connection with the machine exhibition, there will also be established an exposition of sample products, in process of manufacture as well as finished.

(10) In order to enable small manufacturers and tradesmen to purchase their raw materials at wholesale prices and to facilitate the sale of their products, the formation of co-operative stores at designated places is to be encouraged.

I am informed that the establishment of these courses of lectures to mechanics is the initial move in a general plan to be inaugurated in all the main labor centers of Germany, dependent upon the success of this experiment.

The expositions of tools and machinery proposed to be established in connection with the lecture courses, in my opinion, offer an excellent opportunity to American manufacturers to make exhibits.

In the boot and shoe trade, from the making of the lasts to the finished product, American machines are the favorites. Perhaps the same result might be reached with the other

small trades, if masters and workmen in Germany had an ocular demonstration of the superiority of our tools and machines over those they have been using.

W. K. Anderson, Consul.

Hanover, December 9, 1898.

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THE TROPICAL FRUIT TRADE.

During the past 20 years the development of the fruit trade between the United States and tropical ports has been very great. Growth has been steady, and while the trade is already large, it is believed that it is capable of further expansion.

Recent developments in Cuba have worked a great change in this business. For several years Jamaica has furnished the bulk of the supplies of these fruits, particularly bananas, but with a country so large and fertile as Cuba to draw from, the situation will be greatly improved, and receivers in this country expect that profitable trade will follow Cuba's return to normal conditions.

During the past five years the banana supply for this country has amounted to about 15,000,000 bunches annually, and of these fully 7,000,000 have come from Jamaica, most of the remainder from Central America, with a few from Cuba. Jamaica also sends an average of 100,000 barrels of oranges a year, and perhaps 10,000,000 cocoanuts.

The Boston Fruit Co., which has as its sub-agents the American Fruit Co., of New York, the Quaker City Fruit Co., of Philadelphia, and the Buckman Fruit Co., of Baltimore, has fifteen steamers in the West Indian fruit trade, all of which ply between Jamaica and the four ports mentioned.

Since the close of the Spanish war, there has been quick recognition of the possibilities of trade development, and several new companies have been organized in the West Indies to work in conjunction with the Boston Fruit Co. in developing the fruit interests of those islands. There are two on the north coast of Cuba, the Banes Fruit Co. at Banes and the Samana Fruit Co. at Samana. At Puerta Pita, San Domingo, is the Dominion Fruit Co. Shipments from Cuban ports will be light until the island recovers from the destruction worked by the war. Two years ago Banes and Samana shipped 3,000,000 bunches of bananas a year, beside other fruit.

The main purpose of the companies in Cuba will be the development of the banana industry, but the trade in pine-

apples, oranges and cocoanuts will be important features of the enterprise. There are many in the business who believe that Florida has ceased to be an important factor in orange production, and that Cuba is the coming orange producing country. Cocoanuts will also be more largely grown in Cuba, but bananas and oranges will be the principal products.

The production of pineapples is to be largely increased, but these decay so rapidly that there is considerable risk in growing them. San Domingo is hardly a factor yet, but the soil is fertile and the climate adapted to fruit growing, so there should be no question of profitable business later.—New York Paper.

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ENGLAND AND THE NICARAGUA CANAL.

It is reported that the British Consul in Nicaragua is buying up all the Nicaraguan railroad and transportation lines that he can lay his hands on. From this it is evident that, for some reason, our cross-Atlantic kinsmen regard that sort of property in that part of the world as particularly likely to yield a good return as an investment; and we much suspect the reason to be that they foresee that, with the building of the Nicaragua Canal, Nicaragua itself will become a very important point on this hemisphere, and people holding property there are likely to get their own price for it. We hope that there is nothing back of this activity of the British Consul except the ordinary spirit of speculation which leads people to acquire property for a rise; in other words, we hope it is not the British Government itself that is prompting these purchases with a view somehow of compelling us to come to terms with Great Britain with reference to building the canal. We trust that nobody will get it into his head that, having acquired the Philippine Islands and so entered more or less widely into Oriental politics, Uncle Sam has any idea of abandoning the Monroe doctrine as regards the American continent. We do not believe that Uncle Sam's view of the Monroe doctrine has changed at all, and, candidly, we see nothing to make such a change necessary.

Before we get through with it, however, we may see some reason for taking Congress in hand and trying to make it more an instrument of the people's will and less a mere political exchange for the driving of sharp bargains for partisan if not private advantage. Decade after decade has passed by while

Congress has haggled over the Nicaragua Canal question, and the development of the nation has been retarded, awaiting merely the time when some political party should see enough "in it" by way of narrow partisan advantage to make the building of the canal a necessity. The necessities of the nation are nothing as compared with those of political parties, and they do not always attract the attention of Congress unless they chance to be right in line with those of the ruling party. We have seen the effect of this narrowly selfish spirit in the face of every comprehensive measure to revive the American merchant marine, and to create an army and navy sufficient to sustain the dignity and insure the safety of the nation. Up to date, Congress has been certainly a very defective instrument for carrying out the obvious will of the people.—N. Y. Sun.

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SOME KEYS TO SUCCESS.

As developed by a talk on the piazza of a mountain cottage. Thermometer 94 degrees in the shade. Persons: A veteran master-painter, aged 82, and an editor.

"How many years have you painted the steamers of the ———line?" asked the Editor of an aged Swedish-American, still actively engaged in business.

"About thirty, and never have I worked for better people. During all that time, neither by look, nor word, nor by side glance, has there been a word of fault finding or complaint. My service has always been the best I could give. The steamers have always been painted and the paint well dried within the specified time. By the way, did I ever tell you how I came to get the work of the ——— line?"

"No! I would be pleased to hear about it."

"Well, one day a man came running to my shop in Jersey City, and asked if I would go immediately to the steamer ———, just ready to sail, and cut two pieces of skylight glass that wouldn't fit. He said the cost was of no account, as the work was imperative. I said yes, and, getting my tool, hurried to the boat, and in five minutes had the glass cut and in place. When asked for the bill, I replied, 'No charge; it is a simple matter, and I feel abundantly repaid by the opportunity I have had to see the steamer.' Some weeks later I was summoned to another boat to see if I could fix a leaky skylight, which I found had been imperfectly glazed in Liverpool, and as a result

had caused great annoyance on the voyage over, as the water leaked in and ruined carpet and furniture. I adjusted the glass, made the skylight water-tight, and ever since have done all the work of painting the steamers of the ——— line."

"That," I said, "is simply another illustration that courtesy pays, and that it is frequently a good policy to be generous rather than exacting. At the same time, I confess I am astonished that you have retained the work for so long a time, and under different managers."

"A little incident may explain that: One day I was superintending a gang of forty men, engaged in painting the ———, then the finest boat on the line. As I paced the deck, a small man in grey clothes approached, and asked: 'Are you the master-painter?' I replied I was, and asked what I could do for him. His answer was: 'You don't know who I am?'

"'No?'

"'Well, I am Captain ———, of this ship, sir, and I will report you as soon as I get back to Liverpool. I have found you here with forty painters, and every time I pass the men I find them hard at work; there is no noise; no talking between them, and you go about in a very quiet way, and never swear or make any fuss. I never saw a gang of men so well managed. I have never been able to get along in that way. I shall report you, sir. I can't understand how you do it.'

"I told him I hired the very best men I could get; never tolerated an incompetent workman more than one day, treated my men like gentlemen, always paid them promptly, but always exacted the best service they could give."

"That policy," I observed, "always seems to win, no matter where it is enforced, whether by a professional man, a mechanic, a trader, public officers, on shore or off shore. But did the Captain report you at Liverpool?"

"Yes, he did, but I didn't find it out until three years later. I was again busy superintending the men who were painting the ———, when a tall, heavy built man approached and asked, as had Captain ———, 'Are you the master painter?' I said, yes sir! what can I do for you?

"'Do you know me?' he asked, and upon being told no, said that he was Mr. ———, general manager of the line, and wanted to know if I was the man Captain ———, had reported at Liverpool. I said yes, then he said: 'I have been about this ship, have found out for myself that what Captain ——— said was true. Every man is at work and doing his best; no

noise, no confusion, no profanity and you moving about as quiet as a mouse. Now sir, as long as you live and as long as I live you shall paint the boats of this line.' And from that day to this I have done all the work of the company, in that line, as I have for forty years the painting of the boats on the ——— ferry."

This master painter, although four score and ten is still vigorous and at his shop every day, giving close attention to business. He is a trustee in one of the largest savings banks in New Jersey and for a quarter of a century has been a member of the Committee on Investments. His word is as good as his bond. He has been a successful man, is connected with the most representative and wealthy men in Jersey City. He is "diligent in business, fervent in spirit, serving the Lord." It is touching to hear this aged man tell in the public meeting of his faith in Christ and of his hope of immortality. He is an illustration of how he puts religious maxims in practice in all business relations.

As I left the hospitable piazza, I felt that in the few moments' conversation, held with the master painter, on an unusually hot September Saturday afternoon, there was a volume of "secrets of success," for the young readers of the American Grocer. The same incessant devotion to the perfect performance of duty that the master painter gives always brings its reward. It establishes firmly that confidence which is the bedrock of progress and success. It matters not in what sphere we work, whether as the "man behind the gun," or as Rear Admiral; whether as delivery clerk or proprietor of the biggest store, farm or plantation in the world, the same sterling qualities are essential to prosperity. Have you them? —Exchange.

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THE COMMERCIAL SIDE OF DOMESTIC SUGAR-GROWING.

Charles F. Saylor, special agent of the United States Department of Agriculture for the furtherance of the domestic sugar industry, has just reported to the department the result of his investigation. In this report Mr. Saylor pays great attention to the commercial side of domestic sugar-growing, a phase of the industry which has hitherto been thrust to the background in favor of the agricultural side.

The Department of Agriculture, realizing the diversified soil and climatic resources of this country, and the benefits to accrue from the successful domestication of the sugar-beet industry, has undertaken as a part of its active policy to secure to the people of the United States the business of producing $100,000,000 worth of sugar now brought into it for our consumption from other countries of the world. It is a proposition that the people are ripe to consider. The transfer of this vast amount of business to our people from the countries of Europe, carrying with it, as it does, the employment of so much capital and labor, not only in the raising of the beets and in the processes of making the sugar, but in the consumption of raw materials, such as fuel, limestone, etc., makes the proposition at once a national, financial and labor issue.

Our consumption of sugar has been rapidly increasing in this country. This is due not only to our rapidly-increasing population, but to the fact that as our country grows older our people become more and more liberal in providing themselves with the necessaries and luxuries of life. There is also to be considered the increase in use from the constantly growing demands of the arts and sciences.

The beet-sugar investigation of the United States, so far as the Department of Agriculture is concerned, is confined to a study of the adaptability of the various parts of this country for growing the beets and of our facilities for entering into the successful manufacture of beet sugar in competition with Germany, France, Russia and other countries which have achieved success along the line of this enterprise. At present the manufacture of beet sugar in this country is confined to Grand Island and Norfolk, Neb. (under the control of the Oxnards), to Lehi, Utah, (the Utah Sugar Co.), and ranging down the Pacific Coast, in the State of California, to four very extensive beet sugar factories. The first factory is that of the Alameda Sugar Co., at Alvarado, which was the first continuous beet sugar factory in operation in this country, and has been in operation under various experience of profit and loss for many years, having, however, had a successful record for the past seven or eight years. The second is that of the Spreckels Beet Sugar Co., at Watsonville, Cal., about 100 miles south of San Francisco, which is under the management and ownership of Mr. Claus Spreckels, who contributed so extensively to the development of Hawaiian sugar interests. The third factory is that of the Chino Valley Beet Sugar Co., at

Chino, near Pomona, Cal., about 30 miles southwest of Los Angeles, under the control of the Oxnards. The fourth factory is that of the Alamitos Sugar Co., at Los Alamitos, about 30 miles southwest of Los Angeles, Cal., controlled by W. A. Clark and J. Ross Clark, of Butte, Mont. At Eddy, in the Pecos Valley of New Mexico, is situated another factory. At Rome, N. Y., a factory started operations in the fall of 1897. This completes the list of factories now in operation in the United States. At Omaha, Neb., in New York State, in Michigan and elsewhere arrangements have been made to establish factories, commencing with the next sugar-beet campaign. At Salinas, Cal., Mr. Claus Spreckels has made arrangements for constructing a factory with a larger capacity than that of any other factory known in the world.

There can be but one answer to the question as to whether this country will eventually manufacture its sugar. We not only think that it will manufacture the $100,000,000 worth of sugar that we now purchase, but we feel safe in predicting that, in this industry history will repeat itself, and the United States will be offering its sugar to the other countries of the world at a profit.

Although the sugar industry has only had a run of about eight years in the United States in the few factories that have been established, yet, in that short time those in control of these factories have revolutionized the process and materially improved the machinery; the implements of culture and the plan of agriculture in raising the beets have also been materially improved. In a few more years we will have so changed all the methods of growing, manufacturing and refining beet sugar that the conservative foreigner will hardly recognize it as one of his original industries.

The growing of sugar beets is the reverse of almost all other kinds of farming, in that the point to be attained is quality rather than quantity; in fact, it is not farming, unless we consider it of the most intensive kind. It is the highest type of gardening, requiring much labor and attention: and the real problem that we have to meet in this country is to get our farmers to appreciate this fact, and to understand that the growing of sugar beets stands out as a special agricultural problem. If beets be given judicious attention and be grown properly, where the best conditions prevail, there is nothing that will reward the farmer so greatly, provided he has a market through the medium of a factory; but if neglected, or

not handled properly, there is no crop that will remind the farmer so forcibly of his failure in these particulars when the harvest comes.—Grocery World.

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SUGAR CANE NOMENCLATURE.

The article on "Sugar Canes" in the April number of the Journal of the Jamaica Agricultural Society, contains statements having such an important bearing upon this question, that I am led to ask the writer—if you will permit me to do so through your columns—if he would kindly furnish me with the proofs upon which he based his conclusions. I would also be glad to know what the "Ordinary Creole Canes" really are, which in his estimation, are so good for the production of flavored rum. Perhaps by putting what I require to know, in the form of questions, I shall be best understood.

1st. What is the "ordinary Creole Cane?"

2d. What has weaker density to do with the flavor of rum, and how does it affect or alter it?

3rd. The new canes "give more sugar," "better grain," but "less molasses," and an estimated loss of 25 per cent of rum. How is the calculation made?

4th. What occasions the loss of flavor.

5th. What per cent of rum is made per gallon of wash at a given density?

6th. Are the "ordinary black and transparent" canes different from the "ordinary Creole?"

7th. If the density of juice from Creole plants stood at 26, why did the sugar boiler fail to get as much sugar, as from a density of 21, in number 49?

8th. Was the density of the Creole juice due to the presence of other substances in the juice besides sucrose or cane sugar ?

I ask these questions simply with the view of throwing further light upon the question of rum flavor, and of sugar production; for if it can be proved that there is a loss of rum flavor in the spirit obtained from the new canes, it behooves all interested, to know why, if possible; for it is clear that, properly substantiated, it would be a very serious argument against the use of any of the new canes.

These canes used by your correspondent are fairly well-known varieties, and cannot properly be called new, although new to his lands, but I should be glad to send him some of

our proved seedlings, for further trial, in exchange for a few plants of "Creole," "Black," and "Transparent," canes, so that I might be able to substantiate (if correct) the supposition that these canes afford a greater amount of flavor to the rum made from their juice.

So far as I have examined the question, however, I find great confusion in the local nomenclature of various canes which are in Jamaica or elsewhere, but I think it probable that in the long run it will be found that the best sugar producers are of one kind and the best rum producers of another, and not, as is generally supposed, of the same kind. This is, however, only an hypothesis; but if a correct one, we should naturally expect to find similar differences existing among the new canes which are being now raised from seed.

J. H. HART, F. L. S.

Royal Botanic Gardens, Trinidad, 1898.

In reply to the queries by Mr. J. H. Hart, in reference to the report on sugar canes in the Agricultural Journal for April last, I beg to make the following remarks:—

The ordinary Creole canes referred to are black (Dominique) and the white transparent sorts, which are commonly cultivated on the north side of Jamaica, and which have good ratooning and hardy qualities.

The juice from all the canes under experiment was carefully strained and tested by the saccharometer commonly used here—viz., Arnaboldi, the degree marks on which are in the proportion of three to one Beaume (84 degrees temperature), that is, 24 A would equal 8 B. No chemical tests were made, the object of experiment being to get actual results in sugar and rum, so as to have a fair working comparison. I cannot say whether the presence of other substances than sucrose or cane sugar may have affected the density of the juice, but it is likely. All the juices were tried by the usual every day test in practice here, and were boiled in an open battery, after having been treated with quick lime and clarified as customary, the sugar being cured in a centrifugal machine. It was evident during the progress of the experiment that the juice of the new canes contained much water, and "boiled away" considerably, thus accounting for density. Less of it, however, became inverted whilst boiling than in the case of the ordinary juice, yielding slightly more sugar in proportion and less molasses.

Both skimmings and molasses were thinner in "body" as

well as density—hence the difference in return and flavor of rum, more of each being required to set up the wash to the usual density.

The actual weights of the dry sugar obtained from the new canes and the actual number of gallons of rum from the wash set up were ascertained, and a detailed statement was sent in April last to the Botanical Department, to be published, I believe, in the "Bulletin" for April.

Of course, in this district great attention is paid to the manufacture of rum, sugar being almost a secondary consideration, and stout "body" with good flavor is desired. These results were shown in much less degree in the case of the new cane, their spirit being thinner and clearer. It may, however, be remarked that, judging from previous small experiments, the rattoons of the new varieties show similar properties to the Creole canes on being acclimated, in that the juice becomes denser and gives more and better molasses; the extraction, however, is not so good as that of the plants. This seems to point to the soil having some effect on their nature.

The average return per acre of the six varieties was: 34 tons cane, 33¼ cwt. sugar, 124¾ gallons of rum; density, 20½. That from the ordinary plants was: 31 tons cane; 35⅛ cwt. sugar; 178 gallons rum; density, 26. It must be noted that many of the new kinds of cane (especially those of the Bourbon type) are much preyed on by rats, and two of the varieties referred to were much destroyed by these pests causing a poor out-turn, and a reduction of the average.

Laboratory analysis of cane juice is only approximate, as actual practice never yields the results indicated, Nature always having a component unknown to chemistry, which upsets theory.

In like manner (C12, H22, O1), though the formula for sugar on paper is not sugar.

I shall be glad to get seedling tops in exchange for those of ordinary Creole canes here, and to test them in comparison. Our ordinary tops, however, would not be "Creole" to Trinidad, and might not develop the same qualities there.—Sugar.

REMARKS OF SECRETARY WILSON.

At the monthly May meeting of the Louisiana Sugar Planters' Association, Sec. Wilson, head of the U. S. Agricultural Department, made the following statements relative to the sugar interest in the United States and its recently-acquired colonial possessions:

"With regard to your sugar industry, as intimated by your chairman, there has been some doubt about the permanency of a public policy that will encourage you to the utmost to produce sugar. I know that to be the case. One of the first acts ever passed by the American Congress was to protect sugar. The policy of the United States government has not been uniform all the time regarding the protection of the sugar crop, and for that reason I suppose you have not enlarged your acreage as you otherwise would. There are other sugar people in the United States, now, who are just as much interested in a stable, steady, policy, as you are. We have found that the Northern states, from New York all the way to the Pacific, can grow sugar, and people from all these states are interested in it. There will be no question in my mind about the determination of the representatives from that section to have that industry protected. I firmly believe that it will only be a reasonable number of years when the people of the United States will produce their own sugars.

"With regards to these islands, I do not know what the future will bring forth, or what the future policy will be, I do not know what it is now. It is necessary to have a revenue to conduct the governing of them, and to pay their municipal ex- out in Cuba and Porto Rico for example, a tariff bill was framed by the President of the United States which it was believed would be sufficient for the people of Cuba and Porto Rico. It has been a very great success. It is arranged that anybody going into either of these islands shall pay a duty; there shall understood that a man can take care of himself if he has fair play and an even chance. We are selling our goods in the China seas to the extent of forty millions a year under free competition with all the other nations, and are going to sell more. We are sending our goods to Great Britain; our steel goods are going everywhere. The Nile expedition going into Soudan wanted a bridge, and wanted it soon. Our people could and did furnish it. So we are not afraid of the American people taking care of themselves in open trade with these islands. Now then, when they have anything to sell, and come to the United States to sell it, they meet our tariff. If they send sugar, they must pay our duty; if they send rice or tobacco it is just the same.

When I said that I did not know what the future policy would be, I meant that I did not know what Congress would do; but I am inclined to the opinion that the American people, after considering that they have done remarkably well for these islands, have driven the imposters out and given them good honest government, and opportunity to progress, will not do anything that would tend to destroy the sugar industry of Louisiana, or the cultivation of rice, or tobacco which is grown in many states. While rice is not yet grown in the North, we people up there are religiously inclined to protect any American industry—it does not make any difference where found; and I have no doubt there will be the utmost harmony in the future in the protection of American industries in regard to these people. Much can be done for these people in those islands. Scientists have never studied any of their products. Coffee, for example, has never been grown to any considerable extent; they have never crosses the tree that has the finest berries with the tree that has the most. They have never studied the bacteriological disease broke out on a coffee tree in the island of Java and as the scientists there gave it no attention it ravaged every tree in that island as though it were swept by fire. We may help them with regard to their production along other lines. Whatever Dr. Stubbs has touched on here in his classes, they can get by sending for one of his men; and you may depend upon it that these bright young fellows, educated in these channels, will find their way to the market where they can sell their labor. We can help them in all these matters, and I believe the United States government will be disposed to establish experiment stations in the Philippines and Porto Rico so as to enable these people to progress along these lines to as great an extent as possible.

I recognize the fact that the people of the United States have made up their minds that there should be a ditch dug between the Atlantic and Pacific, somewhere around Central America where it can be most easily done. Just as soon as the attention of the nation was brought to the trip of the "Oregon" around Cape Horn, the American people claimed we must build that ditch; we must dig that canal; we are not going to have that happen again. (Applause.) The "Oregon" was needed at Santiago, and got there just in time. (Applause.) The American people have given the order that it must be done, and that means a great deal to you. You are quite close, comparatively, to that canal; the trade between the United States and other countries is growing, and it will grow.

We want, above all things, American bottoms to carry our own products over the world under the American flag; that is what we need more than anything else. I suppose the reason we have not more American ships has been that it costs a great deal of money to go into that business, and that it has been costing more in the United States than in European countries; but yet we are loaning money abroad. I heard last week

that the banks of Iowa had one hundred million dollars of idle money, and that it could not be loaned on real estate at five per cent. The great Mississippi valley is the producing field that is just now feeding the world; it has reached all the way up to its uttermost sources. We don't need to fertilize when we go to that rich country, provided you rotate the crops and grow grasses. We don't need to use fertilizer; I have never seen fertilizer used there and I have lived in Iowa forty-four years. It is from such a country as that that the intelligent American people are piling up money all the time. Possibly another generation may find ways to spend that surplus money, but the present generation of Iowa farmers don't know how, and it won't be spent—it is finding its way eastwardly so as to get invested, and the Eastern people are sending it to Europe. During the last war we had two hundred millions of bonds to sell and fourteen hundred millions was deposited to subscribe for that two hundred million; and at three per cent! The experiment conducted by the Department of Agriculture along that line have been very extensive. We have sent the most approved sugar beet seed to every part of the United States where we could induce the people to interest themselves in it. Two years ago we began with five factories in the United States—two in Nebraska and three on the Pacific Coast. We have reports from nearly all the States that are north of the Ohio river you may say, and from quite a few Southern States south of the Ohio river. Twelve per cent of sugar in the beet, with eighty purity of juice, is considered profitable; that is what they get in France and Germany. The question of labor the question of machinery, etc., were the objections of most of our people to follow experiments even along this line. It was necessary to organize in a great many neighborhoods during the present year to induce the people to make a sensible start. That is, to secure the right kind of land and grow the beets intelligently, according to the most approved methods; to avoid growing them as big as they could get them and to grow them the regulation size of two pounds. We have received samples through the mails from most of these States, and the chemists at the agricultural colleges have analyzed them also, and we find that in nearly all the northern States that the beet is of sufficient richness to justify growing it for sugar. I have been looking very carefully into the growth. Last fall there were nineteen factories in operation in the United States. Next fall there will be forty that we know of; there are five being built in Michigan now. They are building, and getting ready to grow beets in Illinois and there is a prospect in Iowa. They are adding factories on the Pacific Coast. Beets sufficiently rich have been grown in the mountain States. Colorado will, I think, have some factories running next year. So that the matter, in my mind, has gone beyond the experimental stage and I have ceased to take as much interest in it as I did previously.

REPORT FOR MONTH ENDING AUGUST 31, 1899, OF INCORPORATED HAWAIIAN SUGAR COMPANIES.

NAME OF INCORPORATED CO.	Authorized Capital.	Par Value, Shares	Number of Shares Authorized	Shares reported as sold past Month	Highest	Lowest
American S. Co. ($750,000 paid up)	$ 1,500,000	$ 100	15,000			
Ewa Plantation Co	5,000,000	20	250,000	952	$ 28	$ 26
Haiku Sugar Co	500,000	100	5 000	110	250	
Hawaiian Agricultural Co	1,000,000	100	10,000	35	295	
Hawaiian Sugar Co	2,000,000	100	20,000	2065	225	215
Hamoa Plant. Co. (not listed)	175,000	100	1,750			
HonokaaSugar Co	2,000,000	20	100,000	3575	30	26½
Honomu Sugar Co	750,000	100	7,500	318	160	
Hawaiian Com. Sugar Co*	10,000,000	100	100,000			
Hutchinson S. Plant. Co*	2,500,000	50	50,000			
Hakalau Sugar Co*	1,000,000	100	10,000			
Hana Plantation Co*	5,000,000	100	50,000			
Kilauea Sugar Co*	2,000,000	50	40,000			
Kahuku Plantation Co	500,000	100	5,000			
Kihei Plantation Co. ($1,500,000 paid up	3,000,000	50	60,000	15	42½	40
Koloa Sugar Co	300,000	100	3,000			
Kipahulu Sugar Co	160,050	100	1,600	60	15	
Koua Sugar Co, ($180,000 paid up)	500,000	100	5,000			
Maunalei S. Co, ($100,000 paid up)	1,000,000	100	10,000			
McBryde Sugar Co	5,000,000	20	250,000	235	19	18
Nahiku Sugar Co	750,000	20	37,500			
Oahu Sugar Co	2,400,000	100	24,000	530	180	165
Onomea Sugar Co	1,000,000	100	10,000			
Ookala Sugar Co	500,000	20	25,000	585	22½	21¼
Olowalu Sugar Co	150,000	100	1,500	5	165	
Olaa Sugar Co	5,000,000	20	250,000	1568	50	13
Paauhau Plantation Co*	5,000,000	50	100,000			
Pacific Sugar Mill	500,000	100	5,000			
Paia Plantation Co	750,000	100	7,500			
Pepeekeo Sugar Co	750,000	100	7,500			
Pioneer Mill Co	2,000,000	100	20,000	220	282½	260
Wailuku Sugar Co	700,000	100	7,000			
Waianae Sugar Co	300,000	100	3,000			
Waialua Agricultural Co. ($1,500,000 paid up)	3,500,000	100	35,000	275	160	145
Waimanalo Sugar Co	252,000	100	2,520			
Waimea Sugar Mill	125,000	100	1,250			

* Incorporated in California. Sales in San Francisco reported.